

CLAIMS

What is claimed is:

1. A strip-line-type circuit comprising a shunt capacitor , the shunt capacitor comprising a closed conductive loop.
- 5 2. The circuit as set forth in the claim 1, further comprising a transmission line connected to the closed conductive loop.
3. The circuit as set forth in claim 2, wherein the transmission line is connected to the closed conductive loop at two nodes, whereby the closed conductive loop is divided into two segments, each ending at the two nodes, wherein the impedance
10 of one of the two segments is larger than the impedance of the other segment.
4. The circuit as set forth in claim 3, wherein the length of one of the two segments is larger than the length of the other.
5. The circuit as set forth in claim 1, wherein the closed conductive loop is at least partially formed on a layer of dielectric material.
- 15 6. The circuit set forth in claim 5, wherein the circuit is a multi-layer circuit comprising a stack of alternating layers of dielectric material and conductive patterns, and wherein the closed conductive loop is part of at least two of the layers of conductive patterns.
7. The circuit as set forth in claim 5, wherein the closed conductive loop is made of a
20 superconductor.
8. The circuit as set forth in claim 7, wherein the superconductor is a oxide superconductor.
9. The circuit as set forth in claims 8, wherein the oxide superconductor comprises

YBCO.

10. The circuit as set forth in claim 9, wherein the dielectric material is magnesium oxide, sapphire or lanthanum aluminate.

11. The circuit as set forth in claim 1, wherein the closed loop comprises a swirl-shaped portion.

12. A filter, comprising:

a. a transmission line having two conductive leads; and

b. a plurality of shunt capacitors as set forth in claim 1,

wherein each of the two conductive leads of the transmission line is connected to the closed conductive loop of a selected one of the plurality of shunt capacitors.

13. A filter, comprising:

a. a plurality of transmission line portions connected in series; and

b. a plurality of shunt capacitors as set forth in claim 1,

wherein the junction between at least one pair of adjacent, serially connected transmission line portions is connected to the close conductive loop of one of the plurality of shunt capacitor.

14. The filter as set forth in claim 13, wherein the transmission line portions and capacitors comprise conductive patterns formed on a layer of a dielectric material.

15. The filter as set forth in claim 14, wherein the conductive patterns are made of a superconductor.

16. The filter as set forth in claim 15, wherein the superconductor comprises YBCO and the dielectric material is magnesium oxide, sapphire or lanthanum aluminate.

17. The filter as set forth in claim 16, wherein layer of dielectric material is a magnesium oxide substrate no larger than about 50 mm in any dimension and the filter is a band-stop filter having five or more poles.

18. The filter as set forth in claim 14, further comprising a plurality of resonators
5 connected to the transmission line portions, wherein each of the resonators comprises a frequency transformed inductor.